

CLAIMS:

1. An X-ray tube, comprising:

an anode assembly, comprising:

a target for emitting X-rays upon irradiation with an electron beam,

a rotor shaft coupled to a motor rotor system and the target, the rotor shaft configured to rotate the target, and

a bearing system comprising at least two duplex bearing assemblies supporting the rotor shaft; and

a cathode assembly, comprising:

a cathode configured to emit the electron beam, and

an insulator isolating the cathode from ground potential.
2. The X-ray tube of claim 1, wherein the insulator comprises a conical insulator.
3. The X-ray tube of claim 1, wherein the insulator and the motor rotor system are located on the same side of the target.
4. The X-ray tube of claim 1, wherein the insulator is offset in a radial direction to the motor rotor system.

5. The X-ray tube of claim 1, wherein the at least two duplex bearing assemblies distribute load substantially evenly.

6. The X-ray tube of claim 1, wherein the at least two duplex bearing assemblies straddle the target.

7. A CT system, comprising:

a gantry adapted to rotate about a volume;

an X-ray tube mounted on the gantry, the X-ray tube, comprising:

an anode assembly, comprising:

a target for emitting X-rays upon irradiation with an electron beam,

a rotor shaft coupled to a motor rotor system and the target, the rotor shaft configured to rotate the target, and

a bearing system comprising at least two duplex bearing assemblies supporting the rotor shaft; and

a cathode assembly, comprising:

a cathode configured to emit the electron beam, and

an insulator isolating the cathode from ground potential;

an X-ray detecting unit configured to detect the X-rays emitted from the X-ray tube and transmitted through the volume and to generate a detector output signal in response to the detected X-rays;

an X-ray controller configured to operate the X-ray tube;

a data acquisition system for receiving the detector output signal;

an image reconstructor coupled to the data acquisition system for generating an image signal in response to the detector output signal; and

a computer for controlling the operation of at least one of the X-ray controller, the data acquisition system and the image reconstructor.

8. The X-ray tube of claim 7, wherein the insulator comprises a conical insulator.

9. The CT system of claim 7, wherein the insulator and the motor rotor system are located on the same side of the target.

10. The CT system of claim 7, wherein the insulator is offset in a radial direction to the motor rotor system.

11. The CT system of claim 7, further comprising a collimator to direct the beam to the subject.

12. The CT system of claim 7, wherein the at least two duplex bearing assemblies distribute load substantially evenly.

13. The CT system of claim 7, wherein the at least two duplex bearing assemblies straddle the target.

14. An anode assembly, comprising:
 - a target for emitting X-rays upon irradiation with an electron beam;
 - a rotor shaft coupled to a motor rotor system and the target, the rotor shaft configured to rotate the target; and
 - a bearing system comprising at least two duplex bearing assemblies supporting the rotor shaft.
15. The anode assembly of claim 14, further comprising a fixed stem.
16. The anode assembly of claim 15, wherein the rotor shaft is coupled with the fixed stem via the at least two duplex bearing assemblies.
17. The anode assembly of claim 14, wherein the at least two duplex bearing assemblies allows load to be distributed substantially evenly.
18. The anode assembly of claim 14, wherein the at least two duplex bearing assemblies straddle the target.
19. A method for CT imaging, the method comprising:
 - rotating a gantry about a subject at three rotations per second or faster;
 - emitting X-rays from an X-ray tube mounted on the gantry; and

generating one or more images of the subject based upon the attenuation of the emitted X-rays by the subject.

20. The method of claim 19, wherein rotating the gantry comprises rotating the gantry at approximately five rotations per second.

21. A CT system, comprising:

means for rotating a gantry about a subject at three rotations per second or faster;

means for emitting X-rays from an X-ray tube mounted on the gantry; and

means for generating one or more images of the subject based upon the attenuation of the emitted X-rays by the subject.